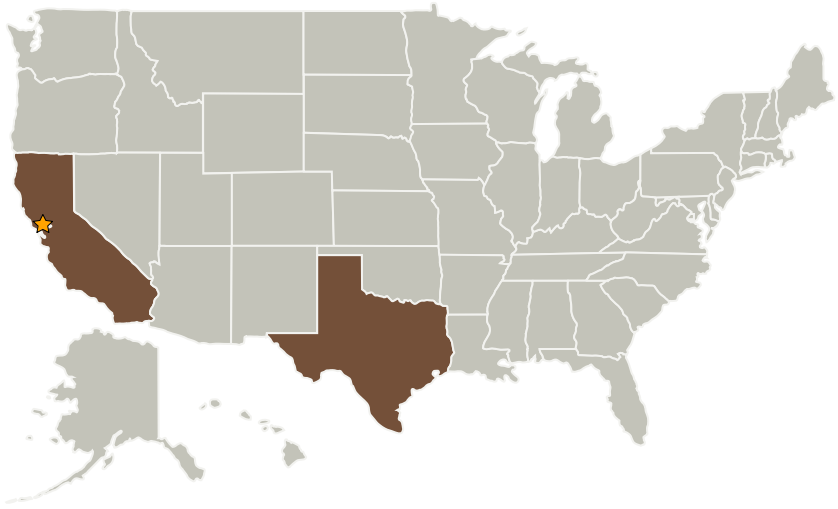
Novel Radiation Protection System Enabled by Hydrogen Enhanced Nano Fibers, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

The need for radiation protection in humans is critical to the success of the nation's continued presence in space. A new radiation protection system will be developed from the recently defined unique hydrogen uptake properties of polyaniline (PANI) nanotubes. The PANI nanotubes have preliminarily shown up to 6% uptake of hydrogen yielding 11-12% total hydrogen content with low total density. The polymeric nature of polyaniline also makes for good structural stability and form stability for shielding elements fabricated from the polymer. The effort in this proposal will identify the compositional stability of the hydrogen-rich PANI system, will advance hydrogen uptake in PANI to > 15%, will test PANI nanotubes for radiation stability and radiation shielding, and will develop design scenarios for the integration of the PANI radiation protection material as cloth or molded parts for space suits and flexible/inflatable habitat applications.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Nano EnerTex	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Houston, Texas

Primary U.S. Work Locations	
California	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.5 Radiation
    - TX06.5.3 Protection Systems